

# Boston Drug Analysis Laboratory

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# Welcome to the Boston Drug Lab!

## ◆ Mission Statement:

- Identifies unknown substances for local, state and federal agencies in Massachusetts.
- Provides accurate and timely analysis.
- Provide Certificates of Analysis.



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# Melendez-Diaz

◆ Trials scheduled: 3065

◆ # of chemist's appearances: 447

Impact of Melendez-Diaz from June 26<sup>th</sup>, 2009 through  
March 31<sup>st</sup>, 2011 on the Boston Drug Analysis Laboratory.

# Evidence Submission

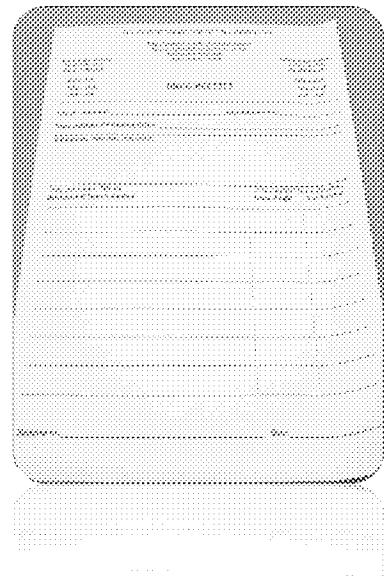


- ❖ At the evidence window, the evidence officer will receive various types of evidence from police departments.
- ❖ Consists of many different types:
  - Substance (Cocaine, Heroin, etc)
  - Rx
  - Marijuana

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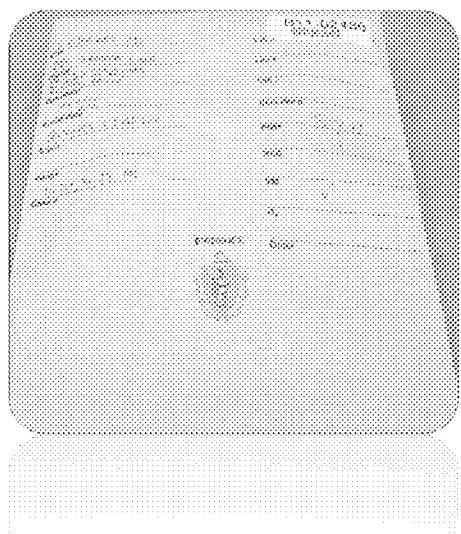
# Evidence Submission

- ❖ A Drug Receipt is filled out. It will contain the following information:
  - Submitting PD and officer.
  - Defendant's name (if known)
  - A description of the item(s).
  - An initial gross weight of the evidence .
  - Then each piece of evidence is assigned a laboratory number.



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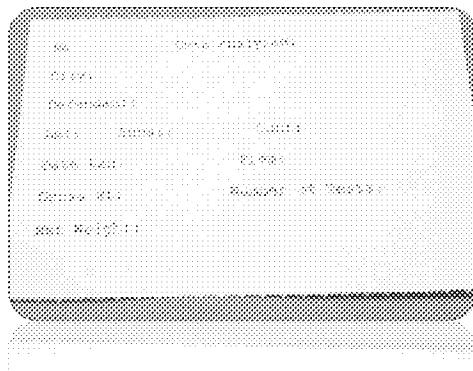
# Evidence Submission



- ◆ The sample is received in a heat sealed and initialed plastic bag.
- ◆ The sample is placed into the manila envelope.
- ◆ A bar code with the appropriate Lab # will be adhered to a manila envelope.

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# Evidence Submission



- ◆ An Evidence Control Card is generated based on the information on the drug receipt.
- ◆ The control card is placed in the manila envelope and put into the safe.
- ◆ At this point , the chain of custody is with the Evidence Office

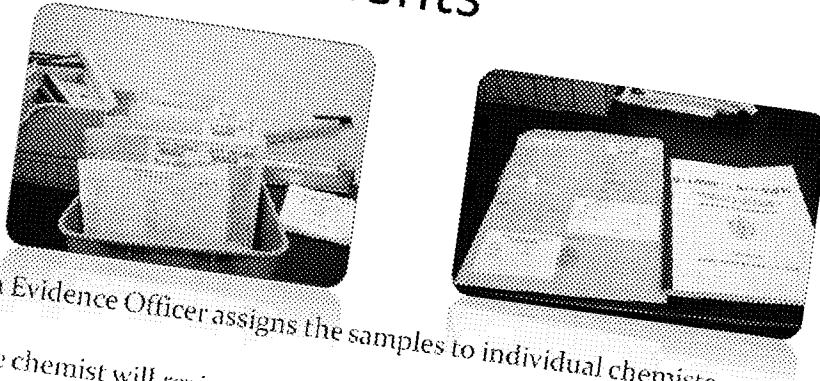
# The Safe

Evidence is transferred to the safe for storage



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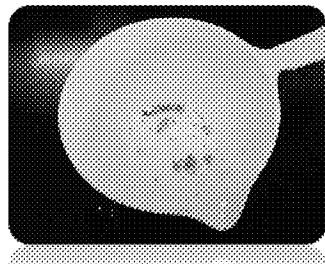
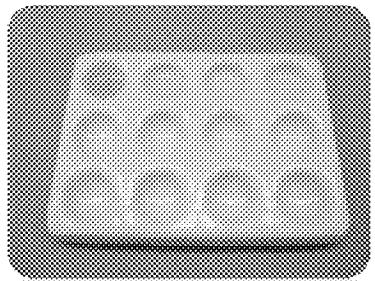
## Case Assignments



- ❖ An Evidence Officer assigns the samples to individual chemists.
- ❖ The chemist will review the envelope, control card and the sample for accuracy. The chemist accepts custody of the sample by signing the corresponding Log Book.
- ❖ Now, the chain of custody is with the Chemist

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## Analysis

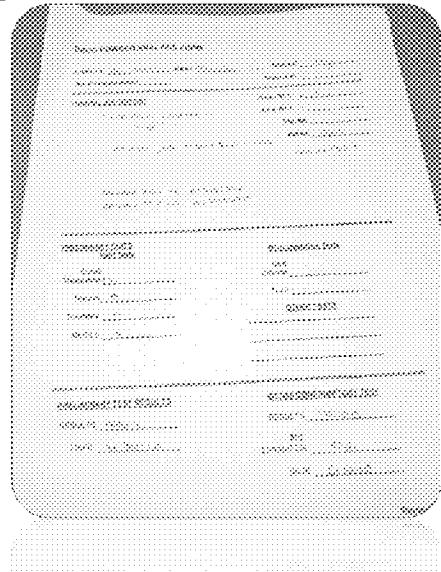


- ❖ The Chemist will analyze the substances according to the Lab Policies and Procedures.
- ❖ The Lab follows the recommendation set forth by the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG).
- ❖ There are different procedures based on the type of sample being analyzed (i.e. a suspected cocaine sample vs. a suspected marijuana sample)

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## Preliminary Analysis - Substance

- ◆ QC of Balance/s
- ◆ QC of Reagents
- ◆ Drug Analysis (Powder) Sheet
  - Chemist's hand notations in regards to the sample



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# Preliminary Analysis - Substance

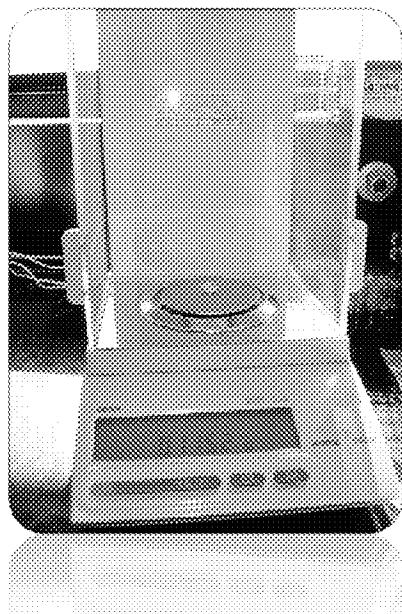
## Weight

- ❖ The weight of the sample can be determined by two methods:

- Indirect
  - Direct

- ❖ Sampling Plan

- 10%
  - Square Root
  - Hypergeometric



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## Preliminary Analysis – Heroin

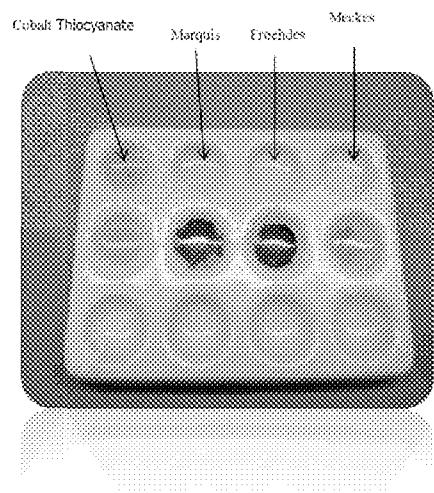


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# Preliminary Analysis – Heroin

## Spot Test

- ❖ Spot tests are performed on the substance.
  - ✓ A total of four spot tests
    - Cobalt thiocyanate
    - Marquis
    - Froehdes
    - Meckes
  - ✓ A purple color change for the Marquis and Froehdes, and a green color change for the Meckes, indicates that the substance may be presumptively positive for an opiate.



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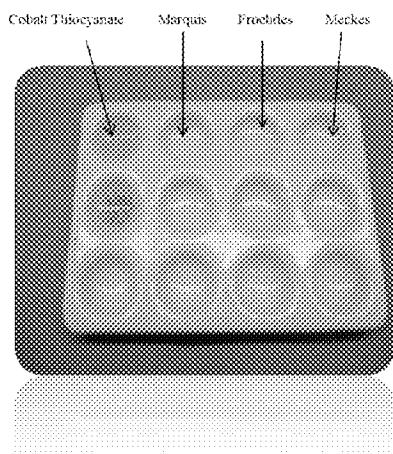
## Preliminary Analysis – Cocaine



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# Preliminary Analysis – Cocaine

## Spot Test

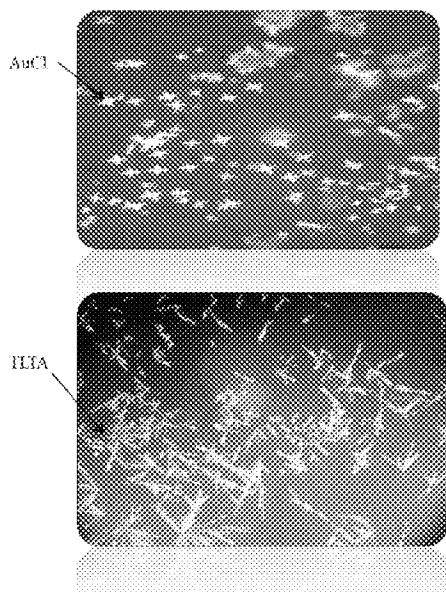


- ❖ Spot tests are performed on the substance.

- ✓ A total of four spot tests
  - Cobalt thiocyanate
  - Marquis
  - Froehdes
  - Meckes
- ✓ A blue color change in the cobalt thiocyanate indicates that substance may be presumptively positive for cocaine.

# Preliminary Analysis – Cocaine

## Microcrystalline Tests

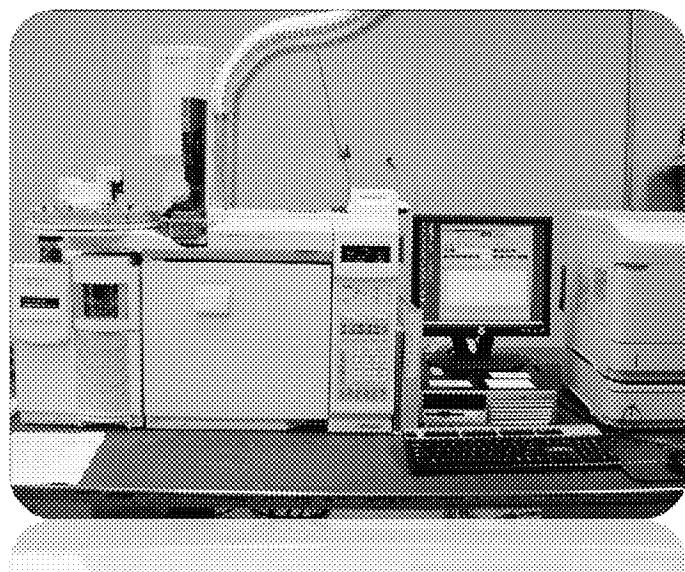


- ❖ Performed if there is a positive cobalt thiocyanate test .
- ❖ Two microcrystalline tests (Structural ID)
  - Gold chloride (AuCl)
  - di-p-toluoyl-l-tartaric acid (TLTA)
- ❖ When these reagents are added to cocaine samples , they will form specific types crystals that can be viewed under a microscope.

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# Confirmatory Analysis

Gas Chromatography/Mass Spectrometry (GC-MS)

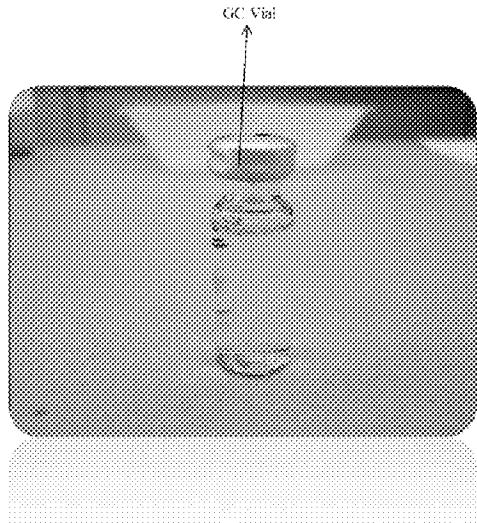


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# Confirmatory Analysis

Gas Chromatography/Mass Spectrometry (GC/MS)

- ❖ For substances from Class A to D, samples are submitted to GC/MS for confirmatory testing.
- ❖ A small amount of the substance is placed in a vial and dissolved with a solvent (methanol).
- ❖ An aliquot of the sample is used when injected into the GC/MS.
- ❖ The instrument separates the components of the substance and then breaks it down into ions, and a chromatogram is generated.
- ❖ The Confirmatory Chemist analyzes the chromatogram of the unknown sample against a known standard to determine the presence of the illicit narcotic.



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## Analysis – Marijuana



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## Analysis – Marijuana

Macroscopic identification



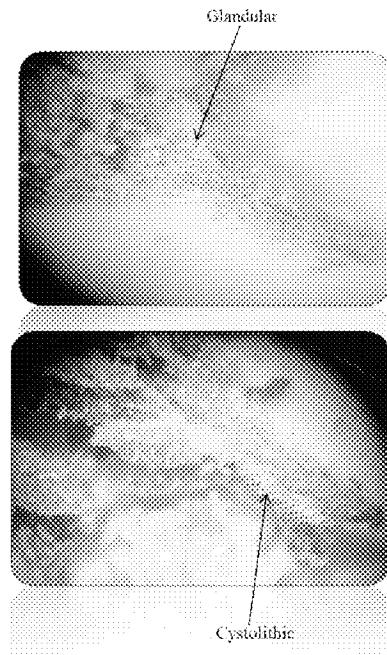
- \* A macroscopic examination of the sample is done.
- \* Identify serrated leaves and morphological characteristics.
- \* Does it look like green, leafy, vegetable matter?

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# Analysis – Marijuana

## Microscopic identification

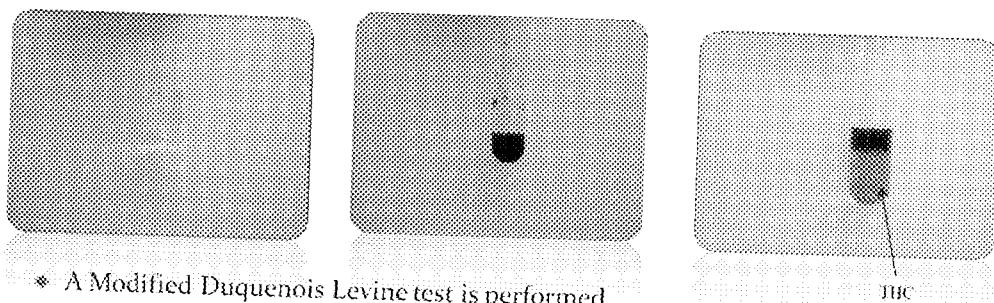
- ❖ A microscopic identification of the sample is performed using a stereoscope.
- ❖ Identify two particular types of hairs. (Structural ID)
  - Cystolithic (bear claws)
  - Glandular



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# Analysis – Marijuana

## Modified Duquenois Levine Test



- \* A Modified Duquenois Levine test is performed.
  - QC of Reagents
  - The chemist will perform a series of extractions during this test
  - The transfer of purple color from one layer to another, indicates the presence of THC

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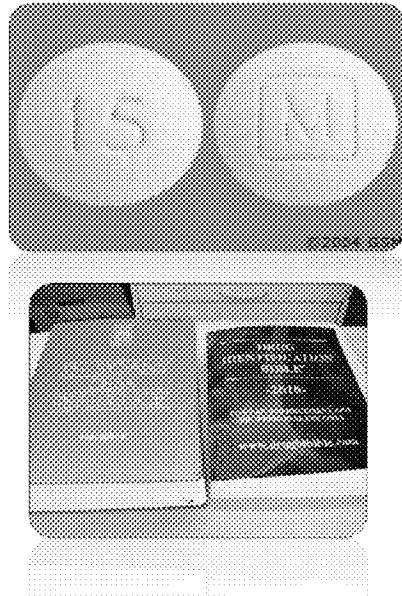
## Analysis – Rx



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## Analysis – Rx

- ❖ Examine & document each pill for identifying marks (shape, color, imprint).
- ❖ Number of pills and the net weight is documented.
- ❖ Compare the ballistics to those in a pharmaceutical reference .
  - Micromedex Software (licensed)
  - Drug Identification Bible
  - Physician's Desk Reference (PDR)
- ❖ Those substances containing an active ingredient from Class A to D will undergo confirmatory testing by GC/MS.
- ❖ Class E substances are confirmed by appearance and labeling .



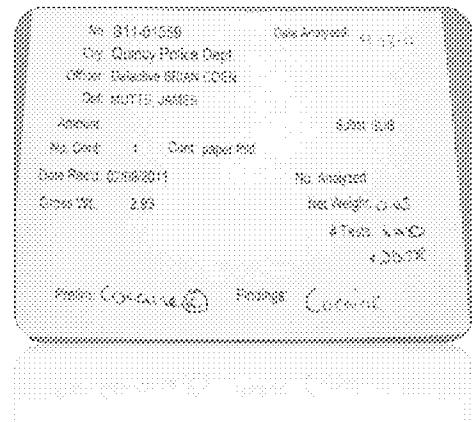
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# Evidence Control Card

- ◆ The evidence control card is filled out by the chemist/s.
  - Results
  - Net Weight
  - Date analyzed
  - Chemist/s who performed the analysis

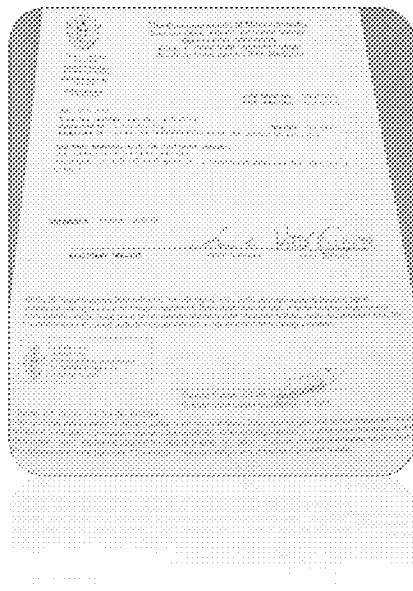
- ◆ Card is returned to the evidence office.

- ◆ A Certificate of Analysis is generated based on the information on the control card.



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# Certificate of Analysis



- ◆ A Certificate of Analysis is generated for each Lab#. It is reviewed and signed by the chemist/s.
- ◆ The first signature is the custodial chemist, who maintains custody of the sample and performs the preliminary analysis & net weight. The second signature is the chemist who performs confirmatory testing.
- ◆ Then the Certificate is notarized.

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# Evidence Returns



- ◆ Upon completion, the sample and the Certificate of Analysis is placed in the manila envelop. Both the envelope and the control card will be returned to the safe.
- ◆ Evidence and drug certificates are returned to the appropriate law enforcement agency.

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# Court

## Discovery Packets

- ❖ ADAs may request, in writing, a discovery packet from the lab via email or fax.
- ❖ Include the Lab # on the discovery request.
- ❖ 14 days advance notice for discovery packets.
- ❖ Discovery packets will consist of:
  - Drug Receipt
  - Evidence Control Card
  - Chemist Drug Analysis Sheets
  - GC/MS Analytical Data

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# Court

## Summons

- ❖ Summons can be emailed, faxed or mailed to the Lab.
- ❖ Include the Lab # on the summons.
- ❖ 30 days advance notice for summons.
- ❖ 48 hours verbal or email follow-up, if needed to appear for court.

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